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Velleris Augusto Cæsare sub Carolo
Hujus Cænobii tenuit moderamina pastor
Terdenis annis pervigil atque tribus."

This also bears date A. D. 1531.

Vol. XXX. In this volume, which is an historical collection upon the governors of the "Low Countries," will be found No. 16367, being the order of battle as given by Marshal Saxe before the celebrated battle of Fontenoy. It was printed at Gand, "par ordre," and is on official paper, something like a placard: it bears date 1st May, 1746.

It may be mentioned, that the order of battle, as presented in this paper, was not the one observed, as it differs materially from a plan of the engagement which is in the possession of the writer, and which was copied from that sent to the King of Prussia after the battle; a copy of this latter plan was also published at Lille in 1745, attached to Voltaire's Poem on Fontenoy, and had it not been correct it would not have been attached to the writings of a court poet. However, the discrepancy is easily accounted for; the Marshal may have changed his mind, and countermanded his orders as first issued.

Vol. XXXI. is a small portfolio, containing, among other numbers, 17056; this is entitled "Anecdotes a la vie de St. Dympna," and is merely a short notice of that saint, not differing from the ordinary memoir of her; it occupies but one sheet of foolscap.

Mr. Ingram read the following note on certain Properties of Curves and Surfaces of the Second Degree.

"The object of the present communication is to show that several large classes of the properties of curves and surfaces of the second degree, most of which, though of considerable interest for their generality and elegance, have hitherto been little studied by geometers, may, with advantage, be regarded as results of that simplest form of the polar transformation, in which a circle or a sphere (according as we are studying the geometry of two or of three dimensions) is used as our *auxiliary.*

" Beginning with curves of the second degree, we may assume the properties of the circle as known. Then,

" 1. If we operate on the circle by the cyclo-polar method, we arrive at the modular generation of the conic sections, and are enabled to discover and prove almost all the properties relating to their foci and directrices. This mode of proceeding has been explained and practised by Poncelet, Gergonne, and others, and is familiar to all students of geometry.

" 2. Let us next place the centre of our auxiliary circle at the centre of the conic, and perform a second transformation ; and we shall thus deduce from the already proved focal properties a series of theorems relating to two remarkable lines, which may be termed the *secondary directrices* of the conic. These lines have already been the subject of some researches of Dr. Booth ; but he has obscured the simplicity of their theory, by presenting their properties as results of a peculiar and somewhat intricate analytic method. I have already noticed, in another place,* the striking analogy which exists between these lines and the *cyclic arcs* in the spherical conics.

" 3. But, instead of placing the origin of transformation at the centre of the conic, we may suppose it situated anywhere in the same plane ; and in this way we shall be led to consider a conic section as the locus of a point which moves so that the square of its distance from a given point is constantly proportional to the rectangle under its distances from two fixed right lines. The transformation at the same time indicates a class of new properties, which might be called *quasi*-focal properties, inasmuch as in a particular case they reduce to the ordinary focal properties, and they are in all cases analogous to those of umbilicar foci in surfaces of the second degree. The generation of the conic sections with which these properties are connected was originally given by Chasles, but the properties themselves to which I allude, have been overlooked both by him, and by Cauchy, who has since discussed analytically the generation in question in his well-known Report on M. Amyot's Memoir.

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* Philosophical Magazine for September, 1844.

" Similar considerations will apply to surfaces of the second degree.

" We assume the properties of the sphere as known. Then,

" 1. From these the properties of the *non-modular* surfaces of revolution are deduced by means of a sphero-polar transformation. This conception has been completely elaborated by M. Chasles, in the Memoirs of the Royal Academy of Brussels. (*Nouv. Mem.* tom. v.)

" 2. Let us now take a non-modular surface of revolution, and make its centre the origin of a second transformation ; and from its properties, discovered in the way just mentioned, we shall infer a great number of the properties of the *modular* surfaces of revolution, especially those belonging to two planes connected with them by remarkable relations. This idea also M. Chasles has suggested, though he has not developed the results of it to any considerable extent. (See Liouville's *Journal de Math.* tom. i. p. 187.)[†]

" 3. If, instead of placing the origin of transformation at the centre of the non-modular surface, we assume it arbitrarily in space, and then operate on the surface as before, we shall light on the *umbilicar method*, and we shall be enabled to deduce, by a uniform process, all the properties of the directive planes and their poles, which arise out of that method. In this way we are led to the theorems which I stated to the Academy on the last night of meeting, as well as to many others of a similar kind.

" 4. It is natural now to inquire what results we should obtain by applying the sphero-polar transformation to the focal

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[*] See also the *Memoire de Geometrie*, appended to the *Aperçu Historique.* § xxii.

properties of surfaces of the second degree with three unequal axes. And accordingly (in the Philosophical Magazine for September, 1844), I have examined what are the results of that process, when the centre of the surface is made the origin of transformation, and in this way I have been led to discover the properties of two cylinders, remarkably related to the surfaces of the second degree.

"5. But, more generally still, we may transform those focal properties, placing the centre of our auxiliary sphere at any point of space; and thus the following leading problem is suggested and solved :

"*Given any surface of the second degree, and a point anywhere situated, to trace on the surface all the plane curves, which, viewed from the given point, shall appear to be circles.*

"The brief indications given in the present note will, of course, require large developments; and these, with the permission of the Academy, I shall endeavour to supply on some future occasion. My object in what I have now said has been merely to direct attention in a general way to several considerable groups of the properties of curves and surfaces of the second degree, which may, with advantage, be studied as results of the Polar Transformation."

DONATIONS.

Mémoires présentés par divers Savants a l'Académie Royale des Sciences de l'Institut de France. Tome IX. (Sciences Mathématiques et Physiques.)

Mémoires de l'Académie Royale des Sciences de l'Institut de France. Tome XIX. Presented by the Institute.

On the Silurian Rocks and their Associates, in Parts of Sweden.

A brief Review of the Classification of the sedimentary Rocks of Cornwall. By Sir Roderick I. Murcheson. Presented by the Author.